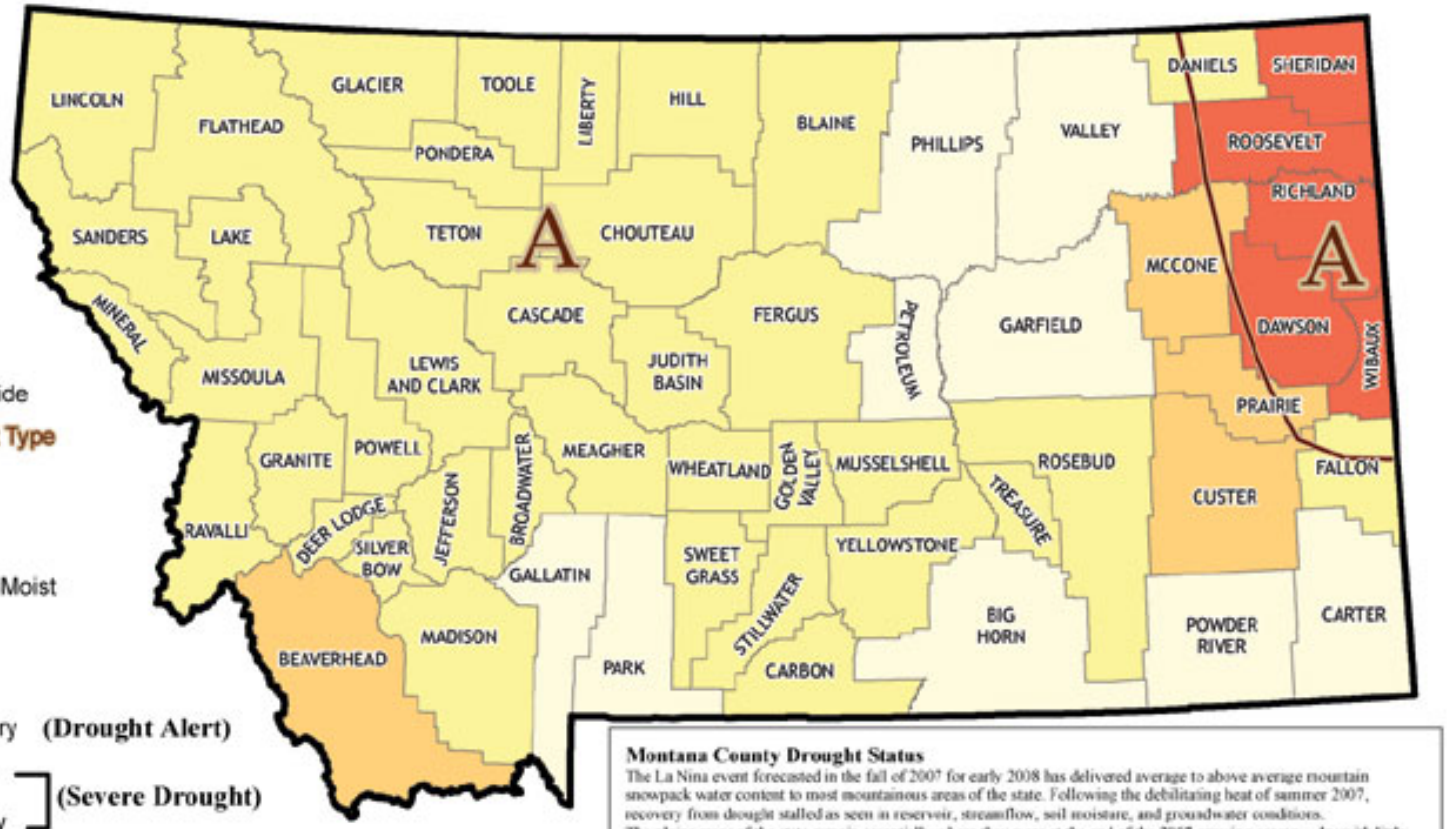
Montana Drought Status by County - August, 2008



Map Key

Continental Divide

Drought Impact Type

Drought Status

August 2008

- No Drought - Moist
- No Drought
- Slightly Dry
- Moderately Dry **(Drought Alert)**
- Severely Dry
- Extremely Dry

(Severe Drought)

Drought Impact Types - **A** = Agricultural - Soil Moisture, Range conditions

H = Hydrological - Water Supplies, Streamflow, Groundwater

Drought Alert - Governor's Drought Advisory Committee strongly encourages local officials to convene local drought committees.

Severe Drought - Local officials should have local drought planning efforts underway or should reconvene the local drought committee at the earliest opportunity.

For recommended responses, see the Montana Drought Plan.

Natural Resource Information System

http://nris.mt.gov/drought/

http://drought.mt.gov/

Montana County Drought Status

The La Nina event forecasted in the fall of 2007 for early 2008 has delivered average to above average mountain snowpack water content to most mountainous areas of the state. Following the debilitating heat of summer 2007, recovery from drought stalled as seen in reservoir, streamflow, soil moisture, and groundwater conditions.

The plains areas of the state remain essentially where they were at the end of the 2007 growing season – dry with little snow cover. The period from December through March brings only about two to three inches in a normal year to plains and valley elevations and spring storms will be important to recovery in these areas. But the water supply outlook looks very favorable as of mid-February for surface water dependent valleys on both sides of the Continental Divide as the mountains reach the two-third mark of the snow water accumulation period for the water year. The concern at this time is whether the state will experience an early snowmelt of mountain snowpack, as in 2007, or a normal runoff period from mid-May through June.

The Governor's Drought Advisory Committee assesses water supply and moisture conditions on a monthly basis to determine drought status for each county of the state. The drought status map is used primarily to promote awareness of drought and to alert Montanans to impending drought conditions so they may respond appropriately.

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For information about how the drought status maps are determined or to learn more about recommended responses to drought see the Montana Drought Response Plan. (http://nris.state.mt.us/drought/committee/DroughtP07.pdf)

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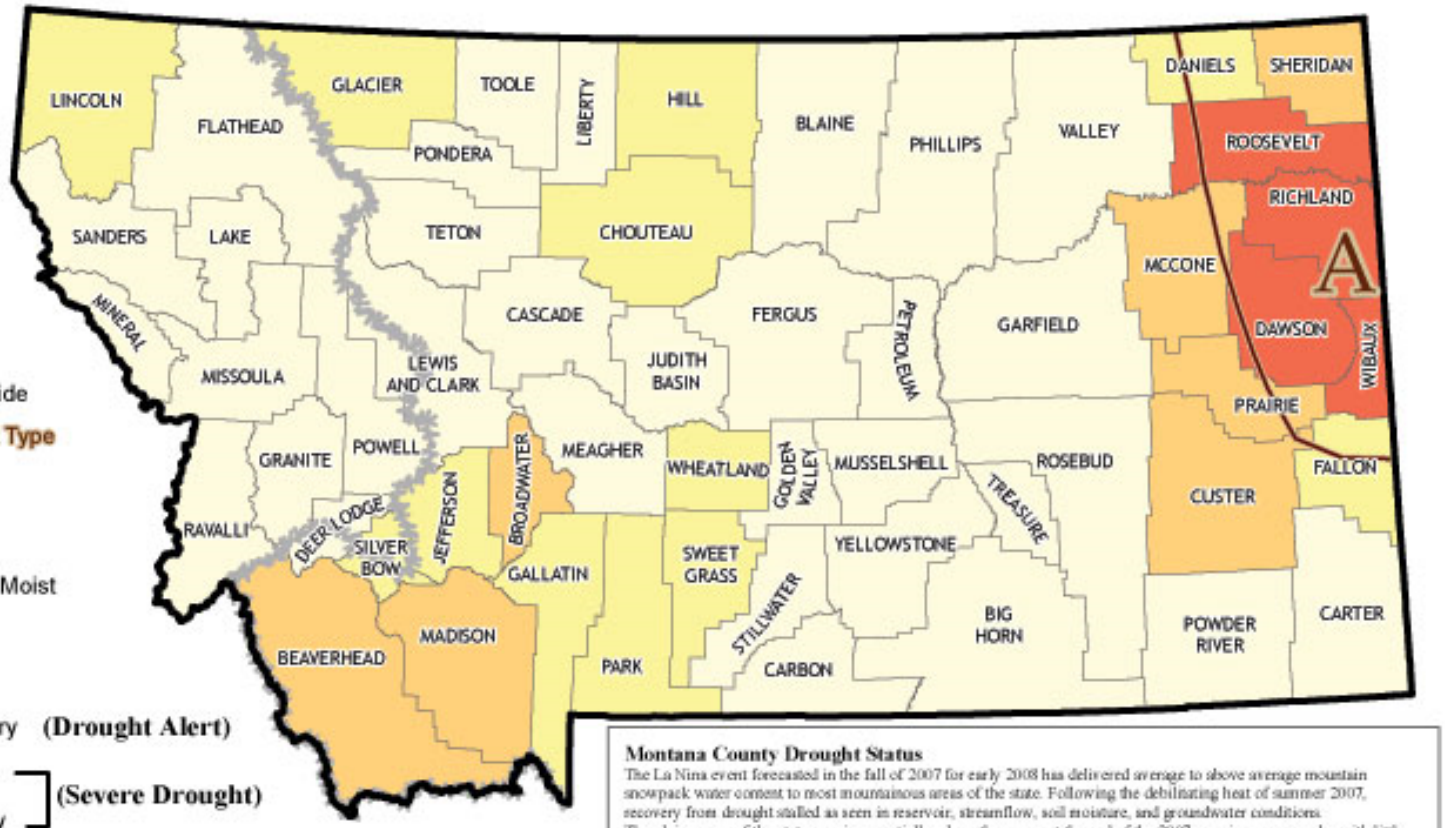

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Natural Resource Information System
http://nris.mt.gov/drought/

DNRC
http://drought.mt.gov/

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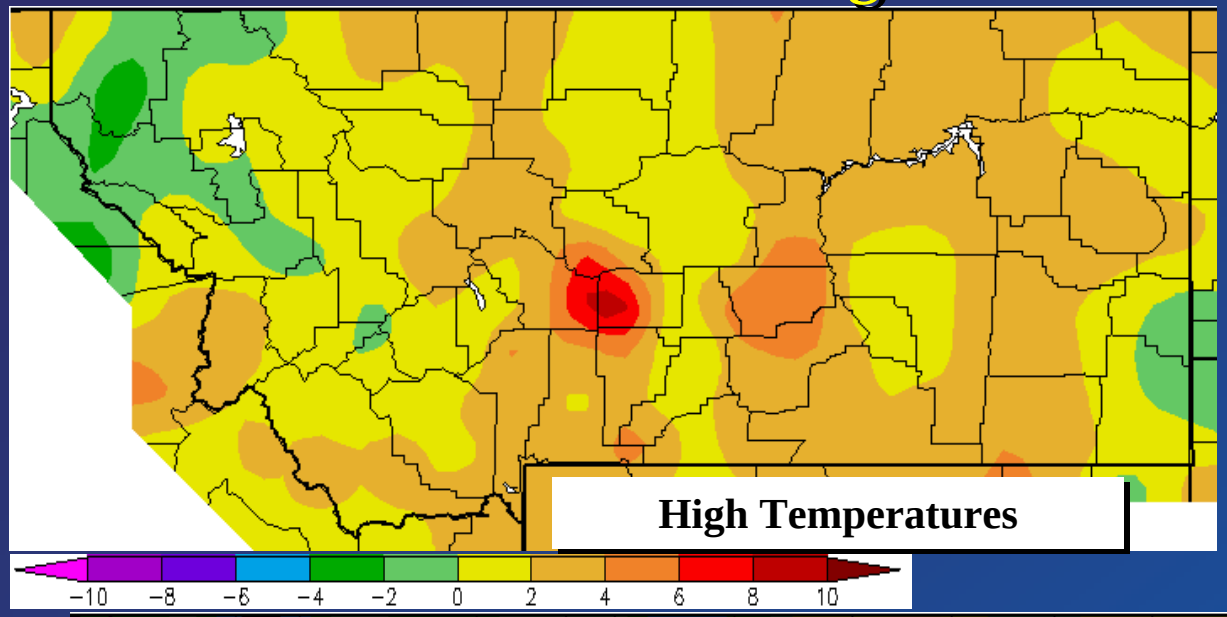
Governor's Drought Advisory Committee Meeting

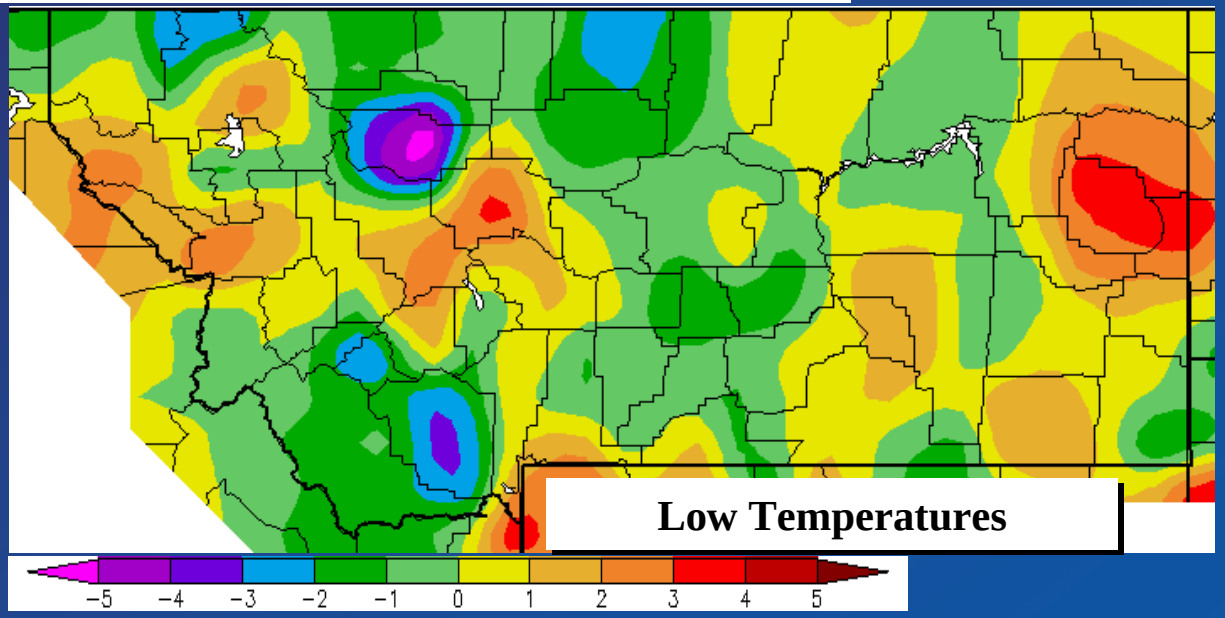
September 17, 2008

National Weather Service

David Bernhardt

Temperature Anomalies
August 2008

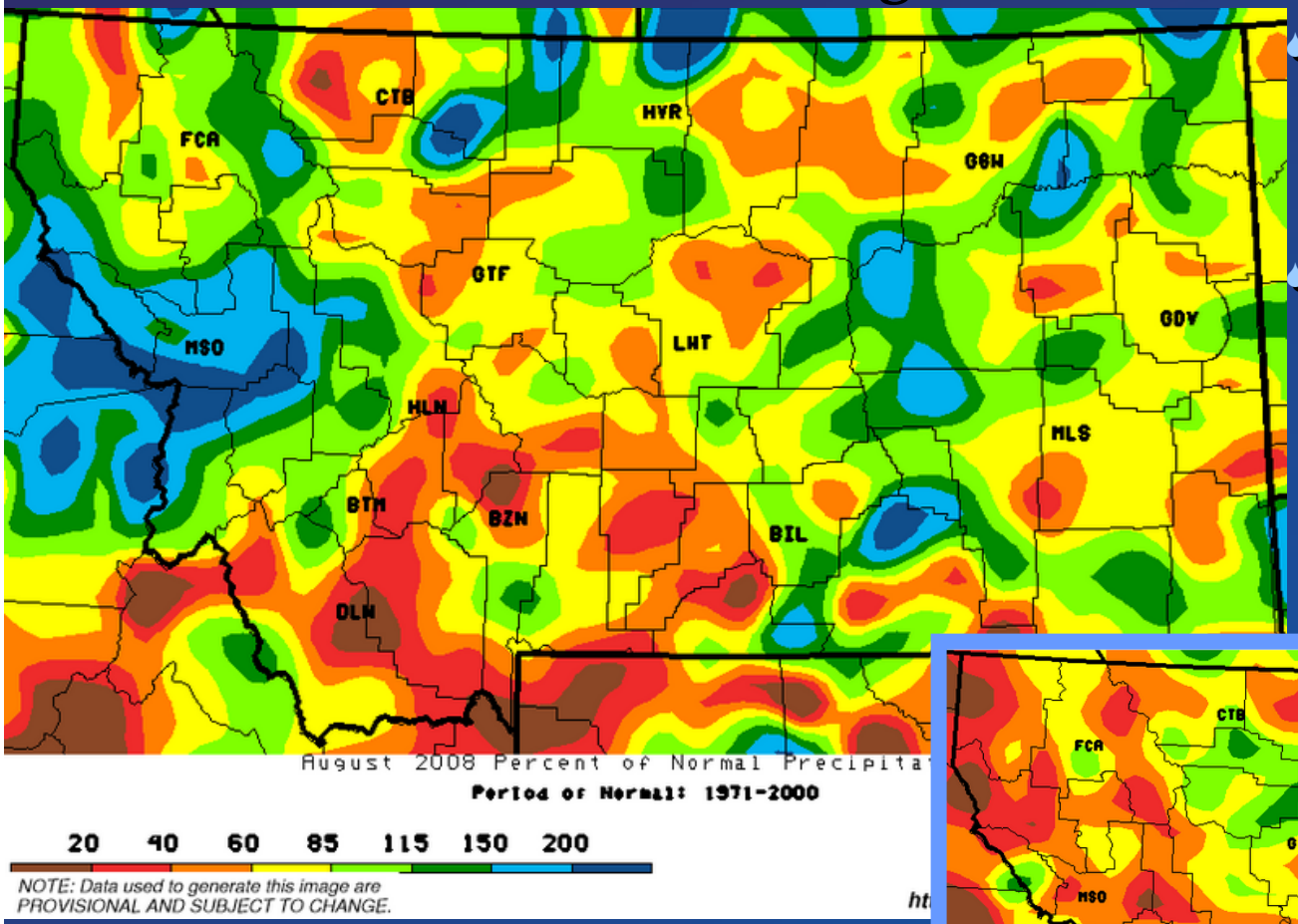




- **August temperatures averaged slightly above normal**
  - ***Highs were generally above normal***
  - ***Low temperatures were slightly below normal.***

Percent of Normal Precipitation

August 2008



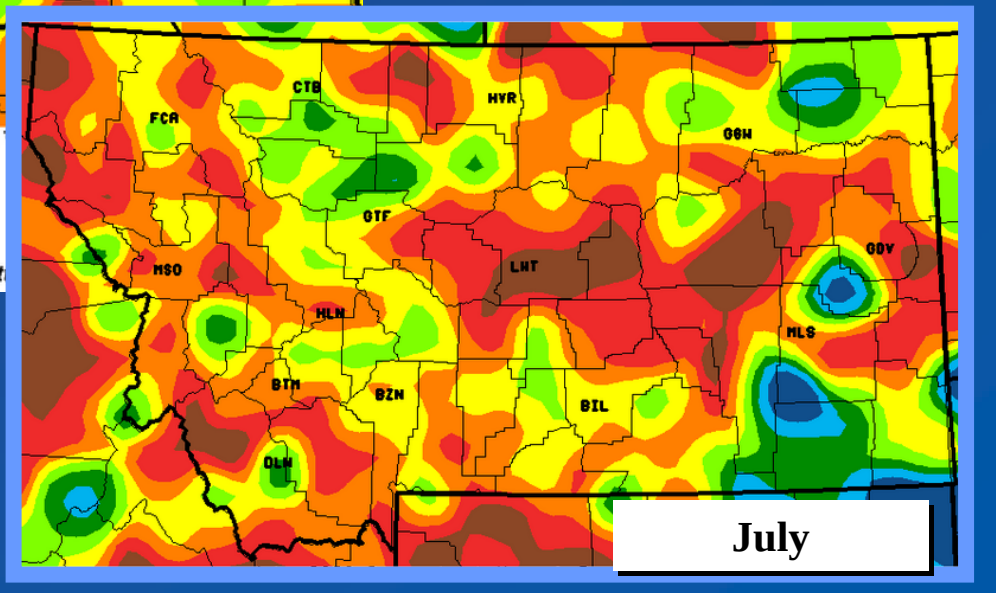
August 2008 Percent of Normal Precipita

Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are PROVISIONAL AND SUBJECT TO CHANGE.

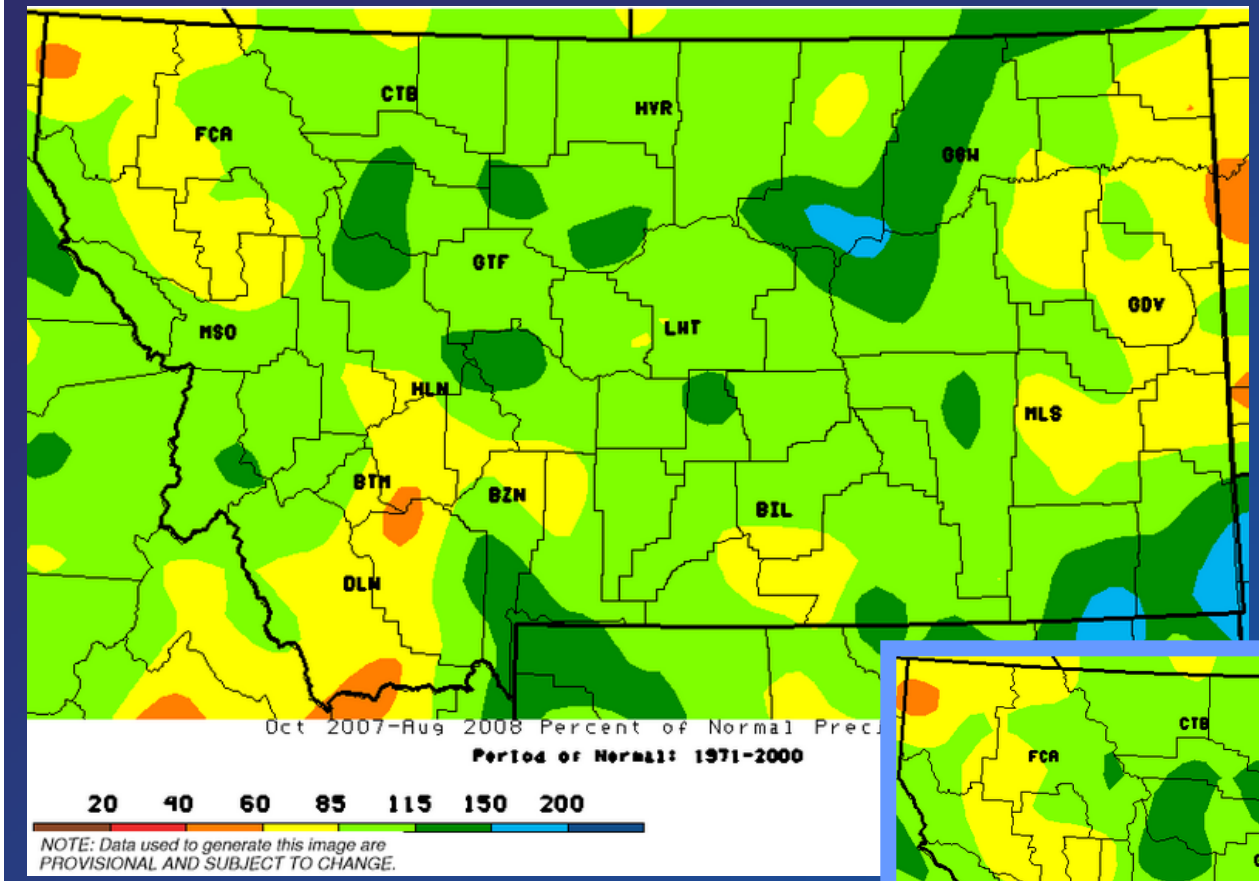
- West of divide – Mostly near to above normal
  - Areas near and south of Missoula more than 200% of normal
- East of the divide – Mostly below to well below normal
  - Areas near Dillon, Bozeman, Red Lodge and Cut Bank less than 20% of normal



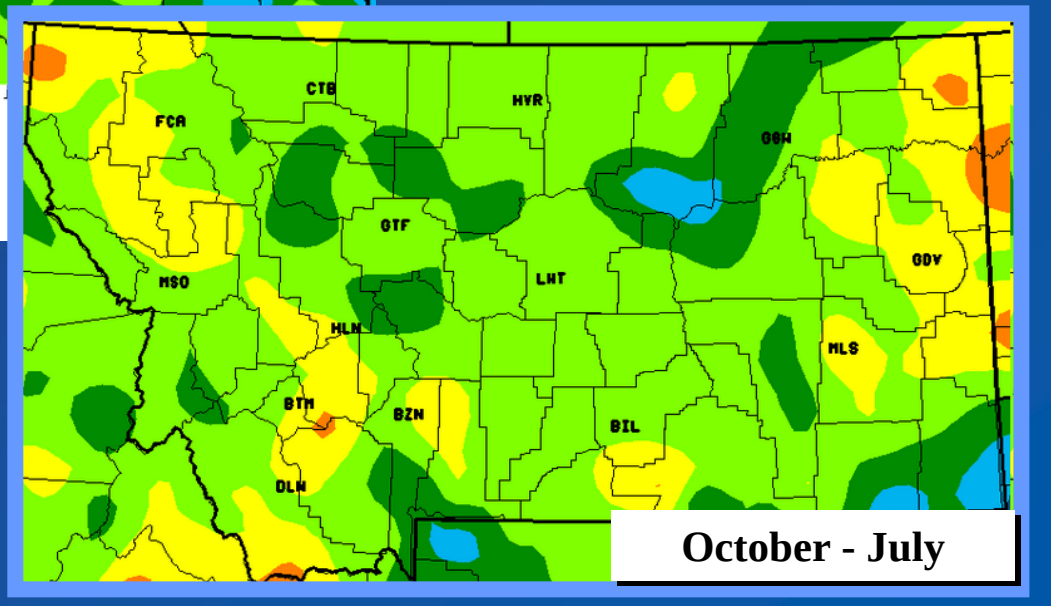
July

Percent of Normal Precipitation

Water Year 2008



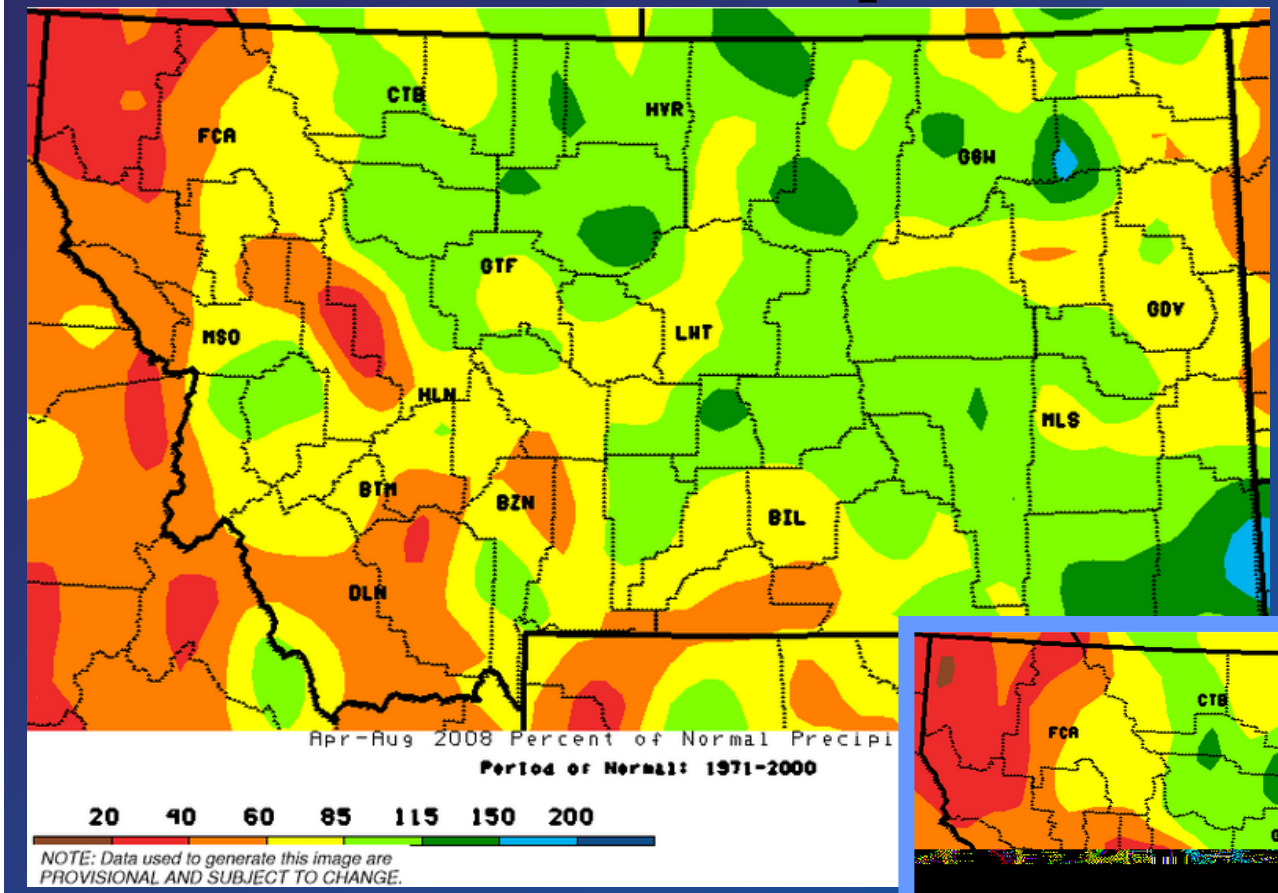
- October – August
- Most of state still averaging near normal
- Still areas west, southwest, south central and east below normal



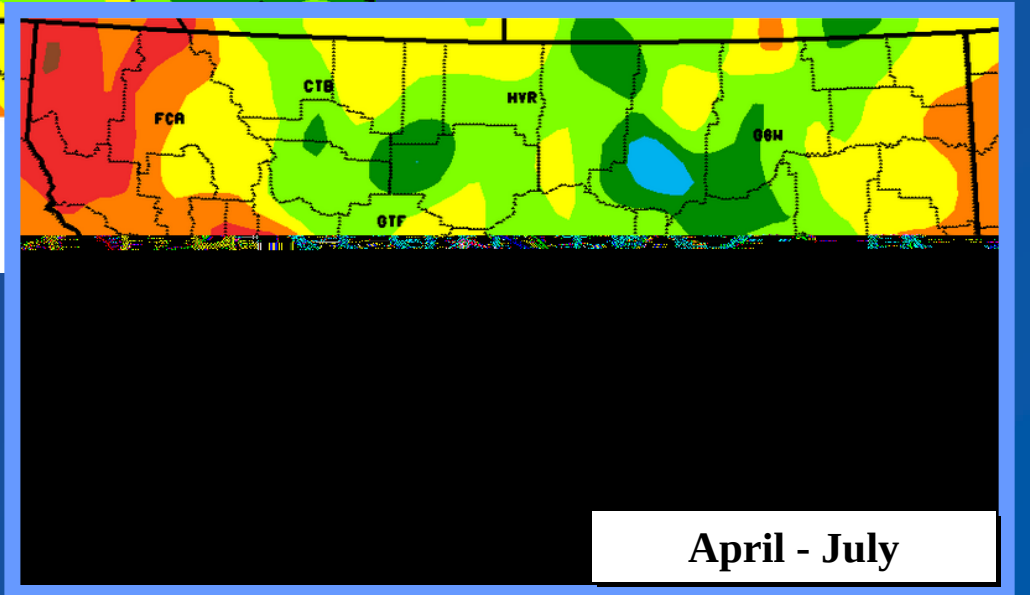
October - July

Percent of Normal Precipitation

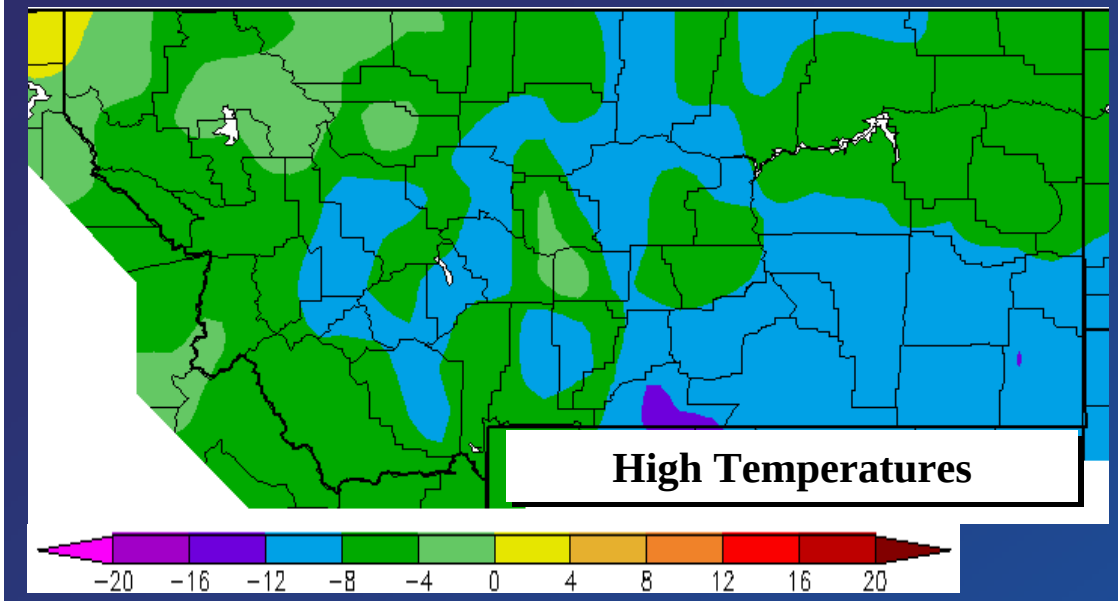
Crop Year 2008

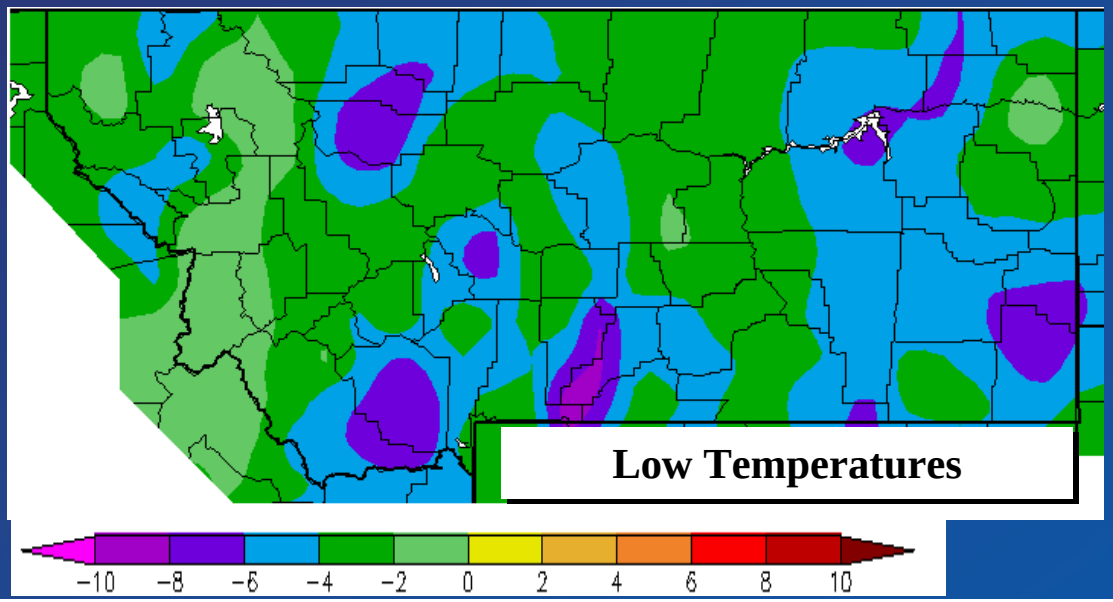


- April – August 2008
- Areas west and southwest – south central well below normal
  - *West of divide has large areas 20% to 40% of normal*
  - *Some improvement noted along border with North Dakota*
- Large portion of state east of divide near normal



Departure from Average Temperature
September 1 – 15, 2008

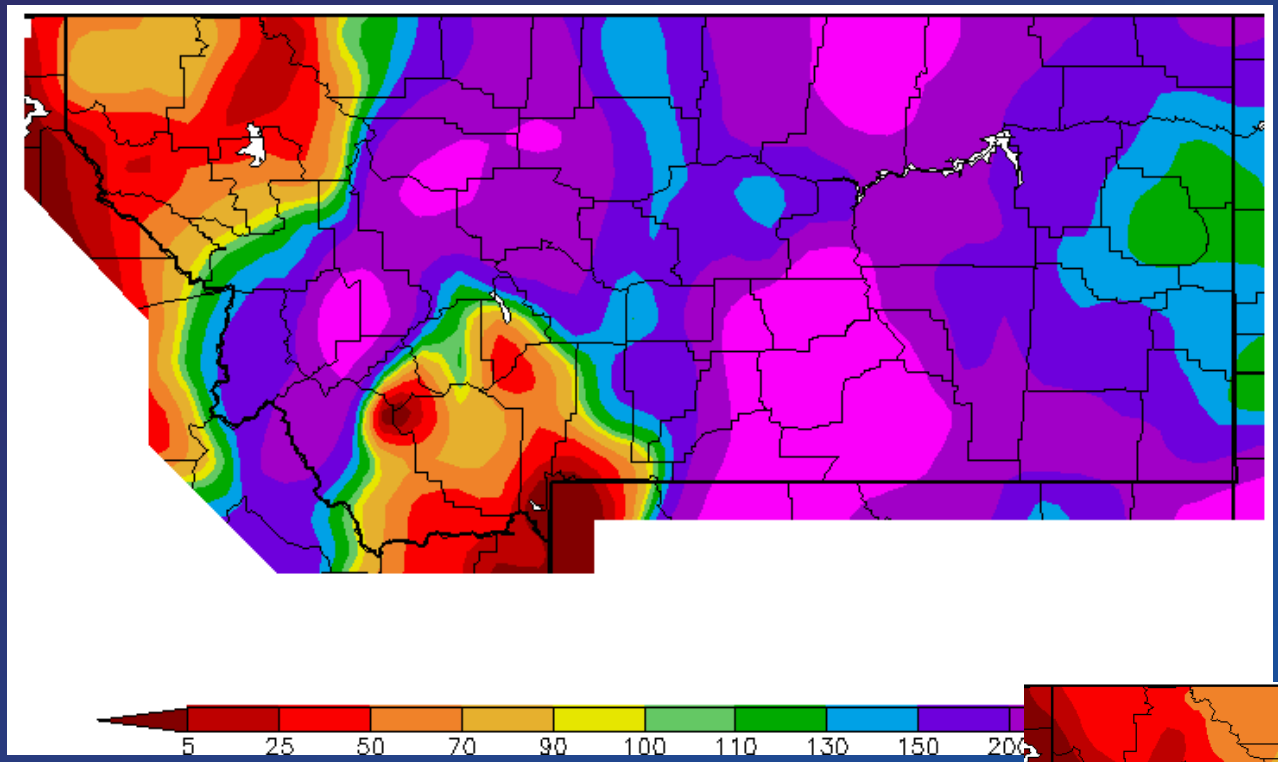




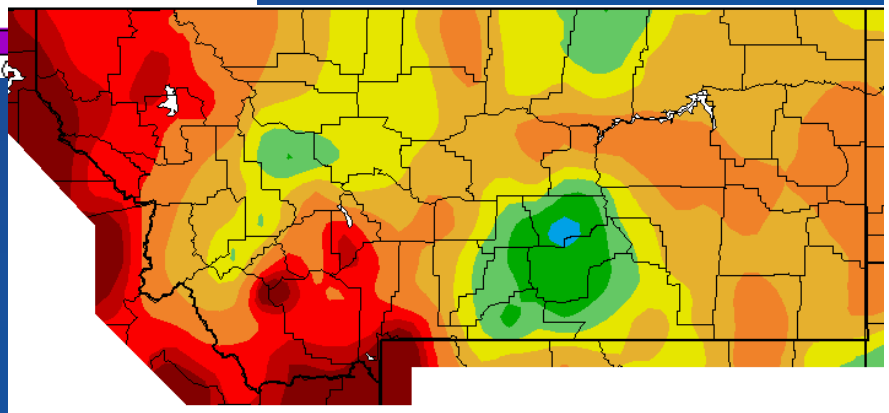
- Persistent series of weather systems have kept temperatures below normal overall, only recently have had above normal temps
  - *Highs*
    - West of divide mostly 4 to 8 degrees below normal
    - East of divide 8 to 12 degrees below normal
  - *Lows*
    - West of divide mostly near to 4 degrees below normal
    - East of divide mostly 2 to 8 degrees below normal

Percent of Average Precipitation

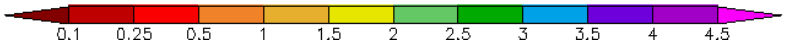
September 1 – 15, 2008



- Most of state seeing above normal precipitation for month so far
  - *Series of weather systems have created widespread areas at more than 200% of normal*
  - *Exceptions are northwest and southwest*
  - *Snowfall over mountains and some lower elevations on September 1*



Sep 1-15 rainfall



Precipitation Totals

September and Water Year 2008

	SEPTEMBER 1 - 15				WATER YEAR TO DATE			
	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML
WESTERN MONTANA								
BUTTE	0.42	0.60	-0.18	70	9.61	12.29	-2.68	78
KALISPELL	0.08	0.60	-0.52	13	12.06	16.61	-4.55	73
MISSOULA	0.81	0.60	0.21	135	11.46	11.62	-0.16	99
MULLAN PASS	0.04	0.70	-0.66	6	37.08	44.86	-7.78	83
SOUTHWEST MONTANA								
BIG SKY	0.37	0.97	-0.60	38	25.16	19.56	5.60	129
BOULDER	0.77	0.60	0.17	128	9.45	11.05	-1.60	86
BELGRADE FIELD	0.27	0.72	-0.45	38	13.54	14.00	-0.46	97
BOZEMAN MSU	0.74	0.90	-0.16	82	22.39	18.39	4.01	122
DILLON AIRPORT	0.39	0.52	-0.13	75	8.26	9.49	-1.23	87
ENNIS	0.43	0.60	-0.17	72	13.56	12.99	0.57	104
HELENA	0.67	0.60	0.07	112	8.85	10.77	-1.92	82
ROGERS PASS 9 NNE	1.29	0.86	0.43	150	17.25	17.02	0.23	101
TOWNSEND	0.36	0.56	-0.20	64	8.10	10.27	-2.17	79
WISDOM	1.30	0.54	0.76	241	11.65	11.45	0.20	102

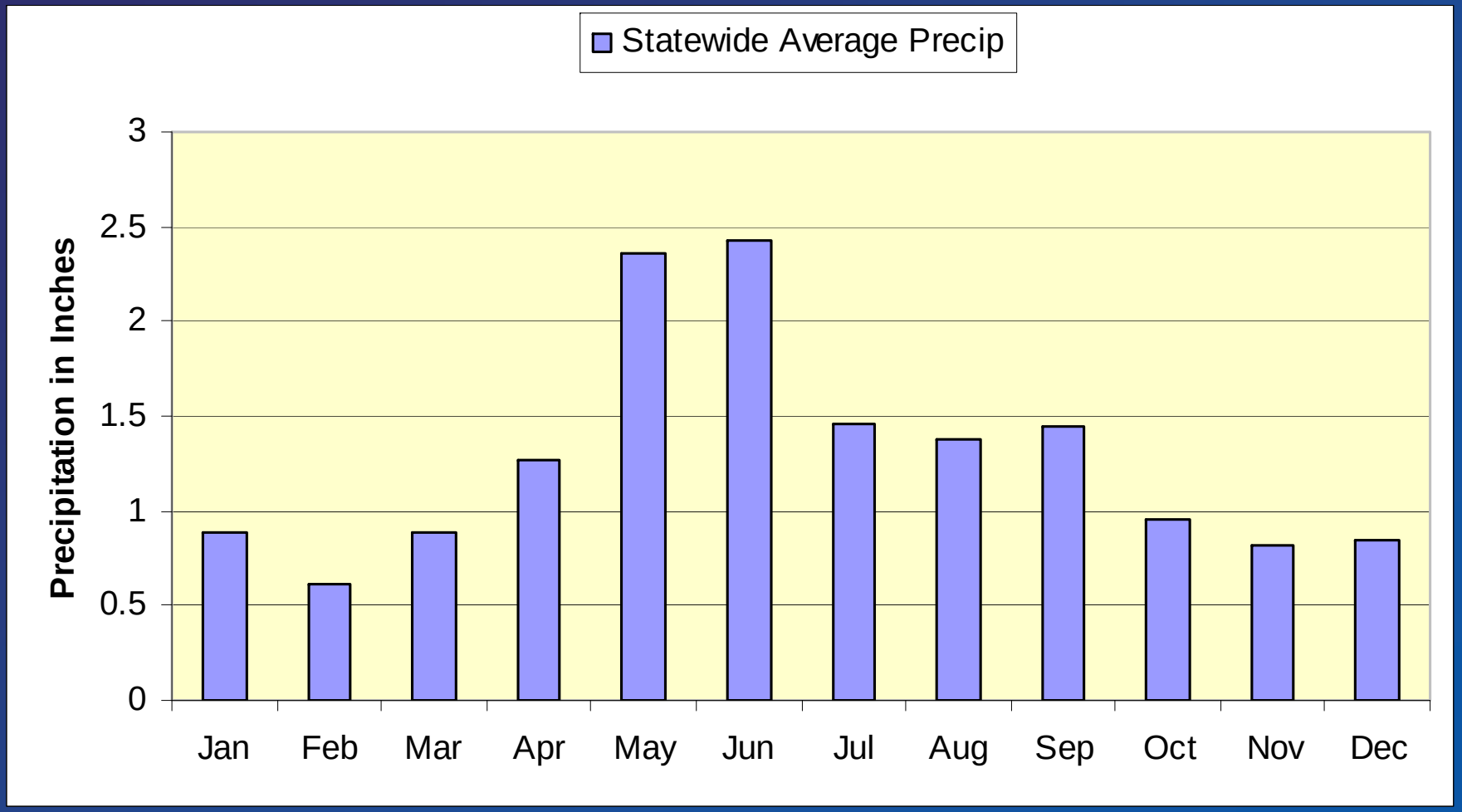
Precipitation Totals

September and Water Year 2008

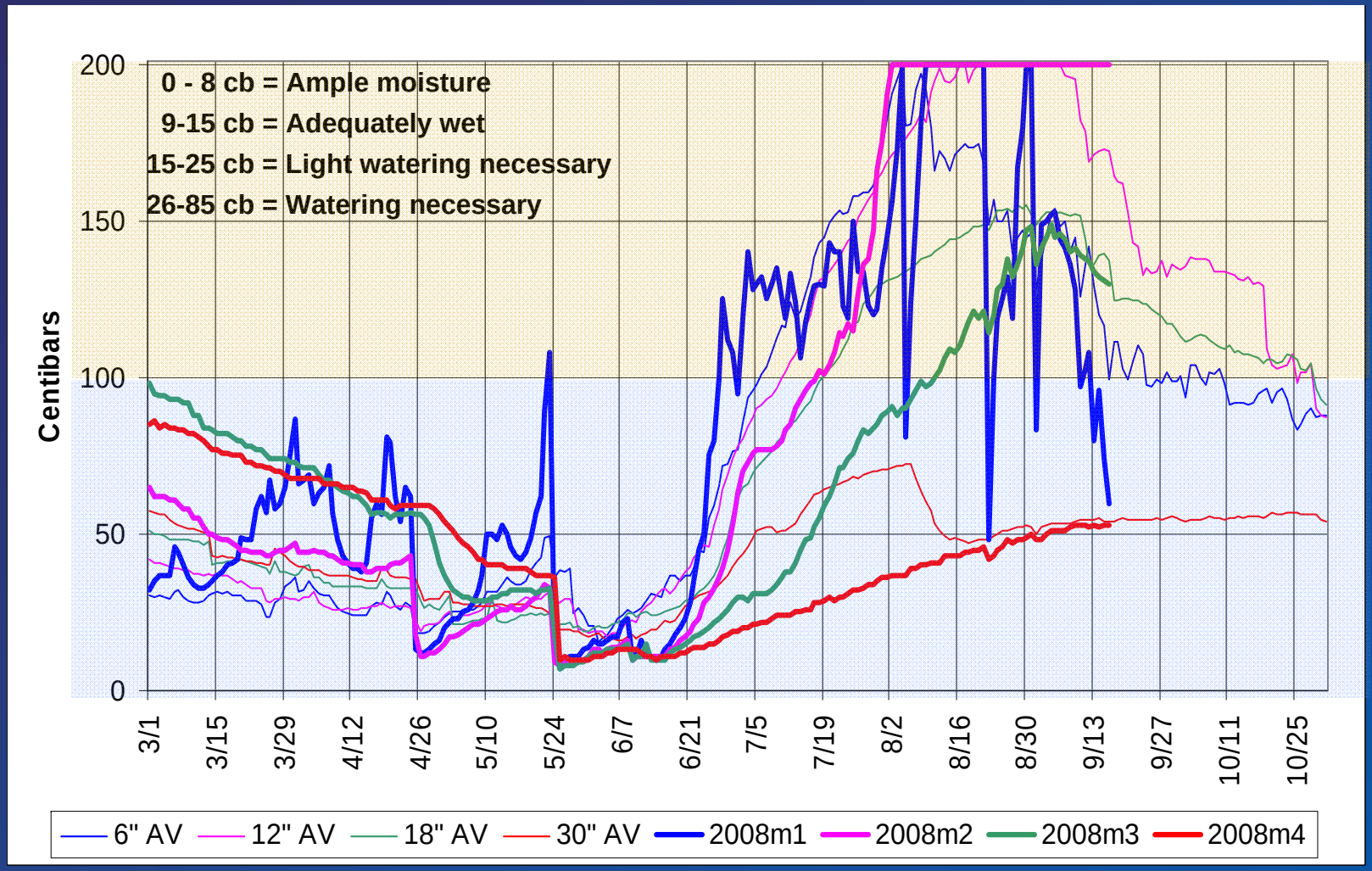
	SEPTEMBER 1 - 15				WATER YEAR TO DATE			
	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML
CENTRAL MONTANA								
BILLINGS	2.44	0.59	1.85	414	13.71	13.94	-0.23	98
CASCADE 20 SSE	1.78	0.75	1.03	235	17.42	13.71	3.71	127
CHESTER	1.27	0.46	0.81	276	10.35	10.22	0.13	101
CHINOOK	0.97	0.75	0.22	129	13.22	12.38	0.84	107
CHOTEAU	1.64	0.56	1.08	280	15.09	10.18	4.91	150
CONRAD	1.34	0.57	0.77	235	11.30	11.62	-0.32	97
CUT BANK	1.19	0.69	0.50	172	13.11	12.02	1.09	109
FORT BENTON	0.94	0.67	0.27	140				
GOLD BUTTE 7 N	1.31	0.81	0.50	162	14.18	13.04	1.14	109
GRASS RANGE	1.24	0.67	0.57	185	17.19	15.91	1.28	108
GREAT FALLS	1.76	0.66	1.10	267	15.82	14.37	1.45	110
HARLEM	1.88	0.70	1.18	269	10.38	10.88	-0.50	95
HAVRE	0.92	0.58	0.34	159	10.60	11.01	-0.41	96
LIVINGSTON	1.03	0.75	0.28	137	13.43	15.00	-1.57	90
LEWISTOWN	1.39	0.76	0.63	183	16.06	17.23	-1.17	93
MARTINSDALE 3 NNW	0.90	0.65	0.25	138	12.24	13.03	-0.79	94
MILLEGAN	1.19	0.92	0.27	129	19.59	17.51	2.08	112
NEIHART 8 NNW	1.51	1.05	0.46	144	21.58	20.49	1.09	105
SHELBY	1.01	0.52	0.49	194	9.16	9.14	0.02	100
STANFORD	1.29	0.78	0.51	165	16.11	16.45	-0.34	98
VALIER	1.33	0.66	0.67	202	12.32	11.82	0.50	104
WHITE SULPHUR SPRGS	0.64	0.63	0.01	101	11.68	12.62	-0.94	93
EASTERN MONTANA								
GLASGOW	1.18	0.53	0.65	223	14.26	10.80	3.46	132
MILES CITY	0.98	0.59	0.39	166	9.41	12.86	-3.45	73

Statewide Average Precipitation

September is last of 'wet' months

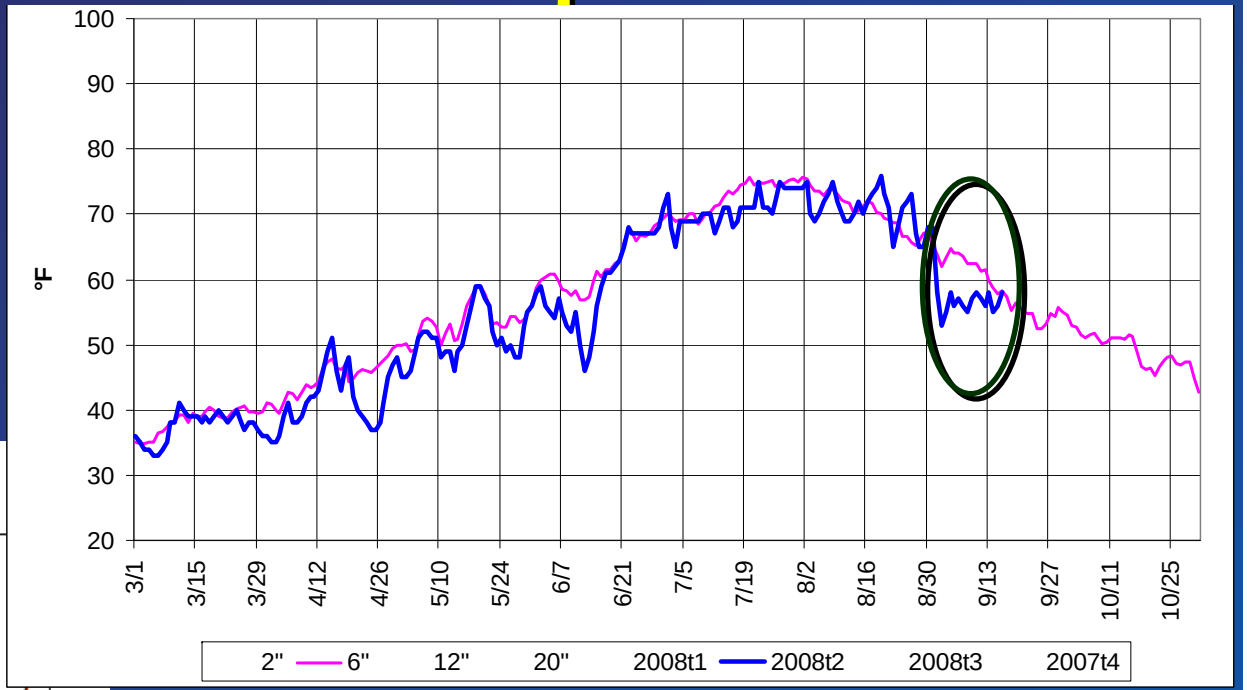


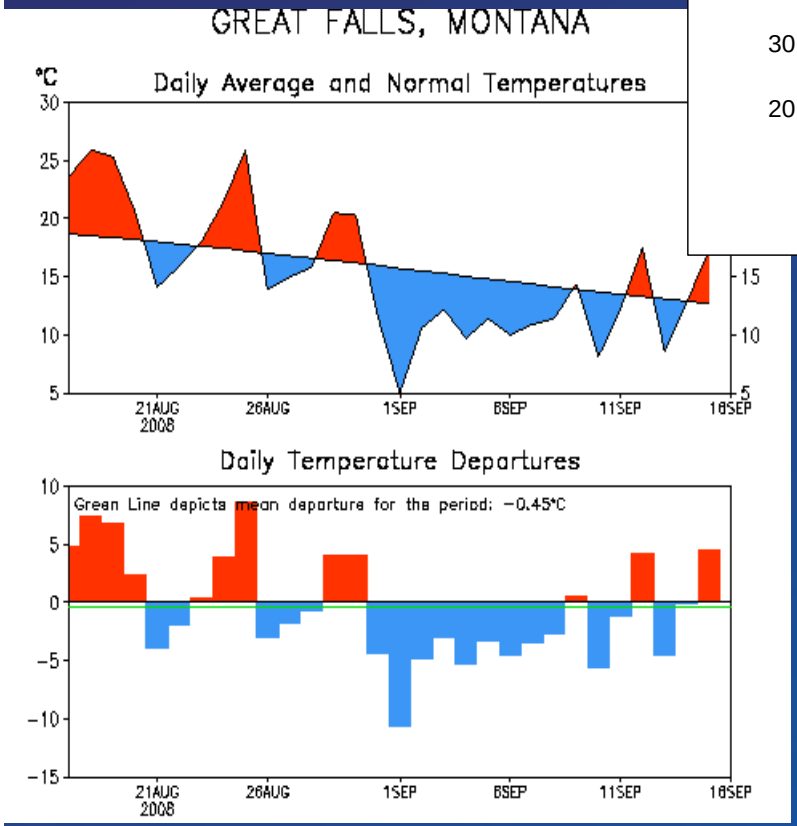
Great Falls Soil Moisture



- Shallow moistening due to recent rains
- 12 inch readings continue dry around 200cb, but near “normal”
- 18” and 30” levels running near ‘average’ for 2003-2007

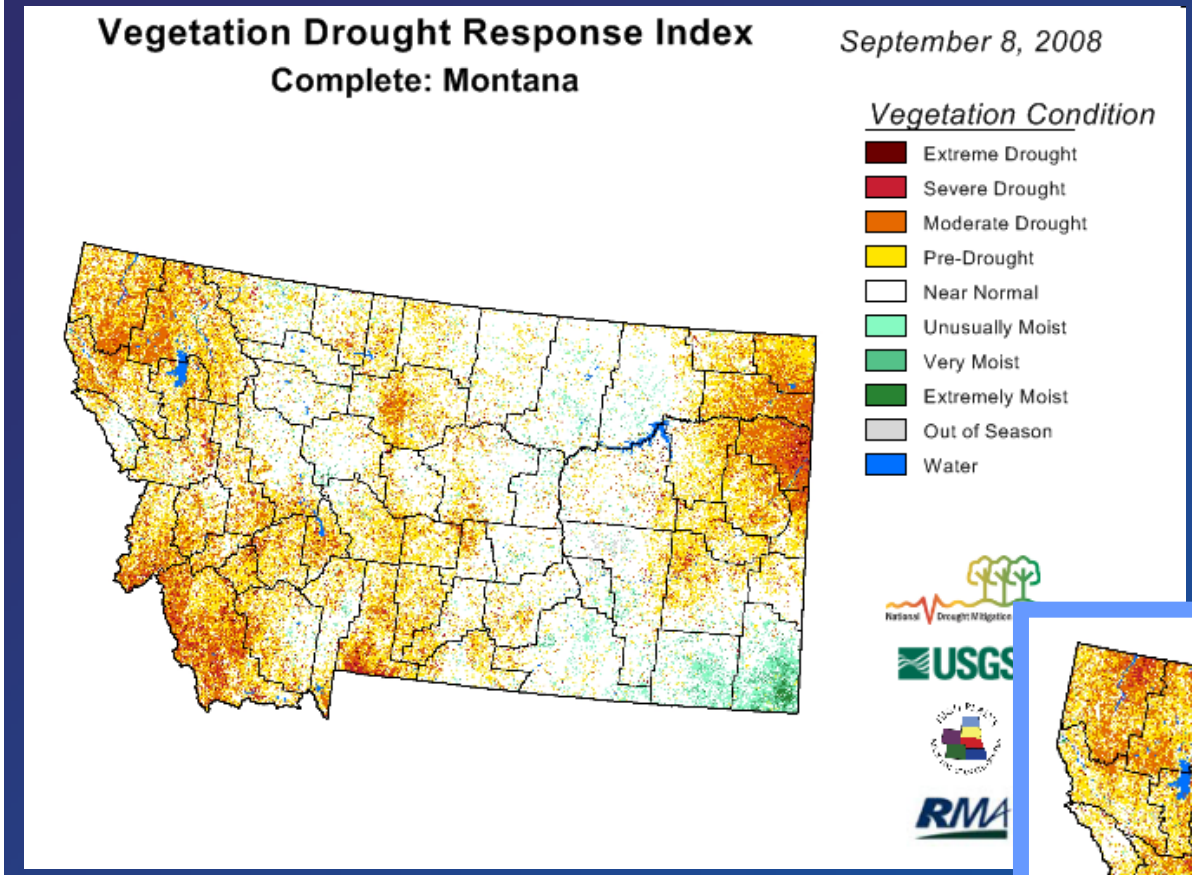
Great Falls Soil Temperature



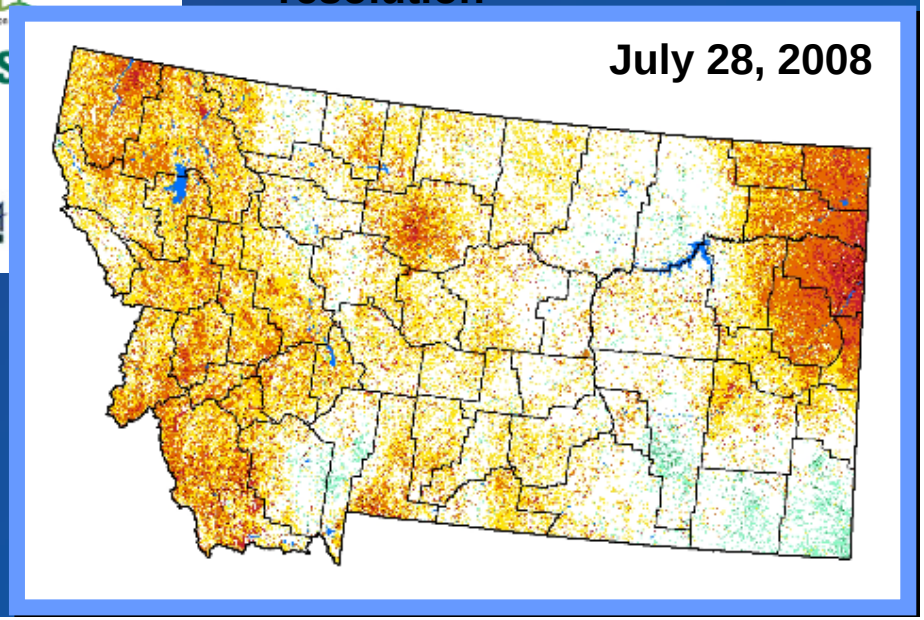


- Recent two week cool spell one of coolest of record for early September.
- Reflected in 6″ soil temperature

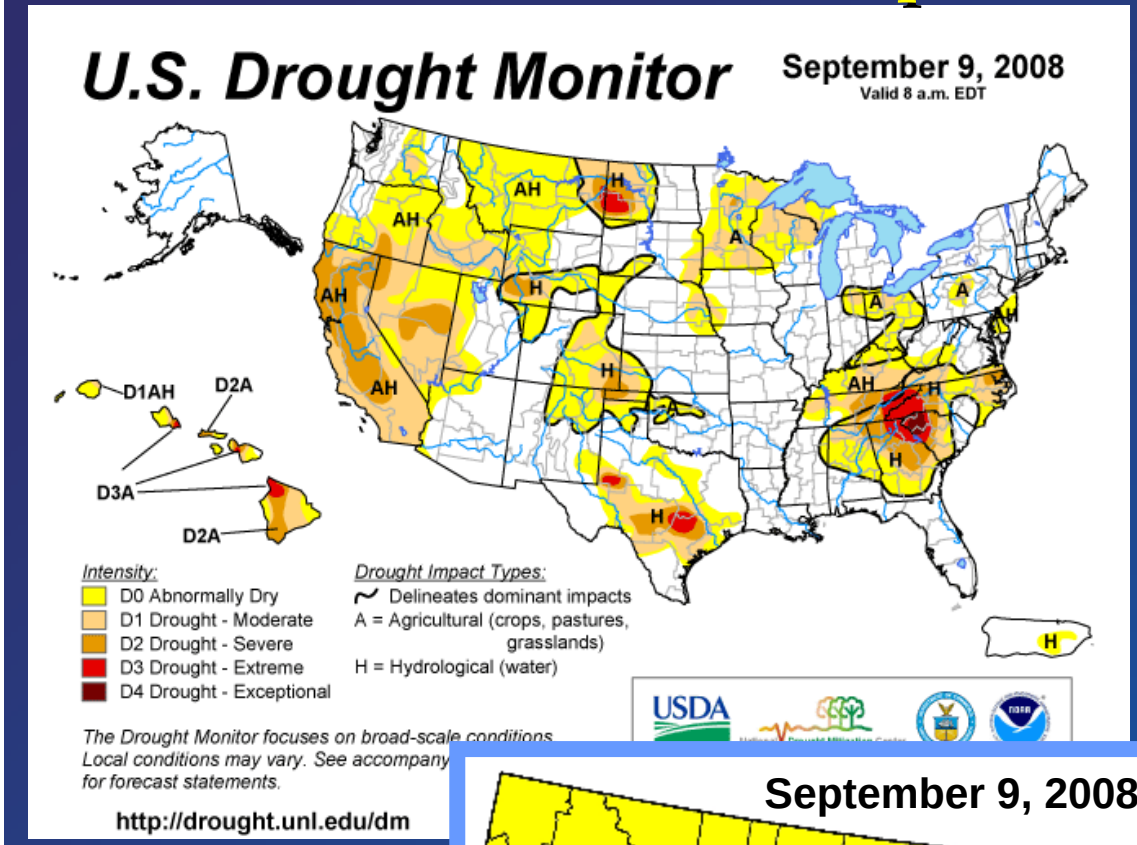
VegDRI Index
Vegetation Drought Response Index



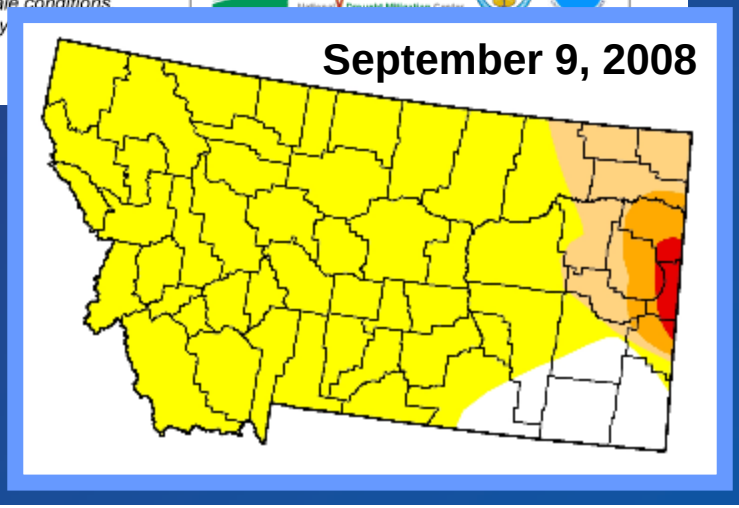
- Vegetation showing overall improvement as a result of recent series of storms
- VegDRI integrates satellite-based observations of
  - *Vegetation conditions*
  - *Climate data*
  - *Land cover/land use type*
  - *Soil characteristics*
  - *Ecological setting*
- Spatial detail 1-2 km resolution

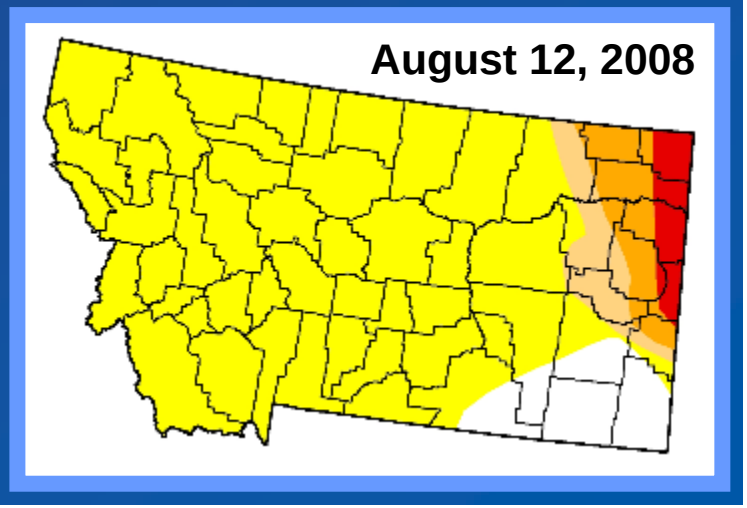


National Drought Monitor
Released September 11, 2008



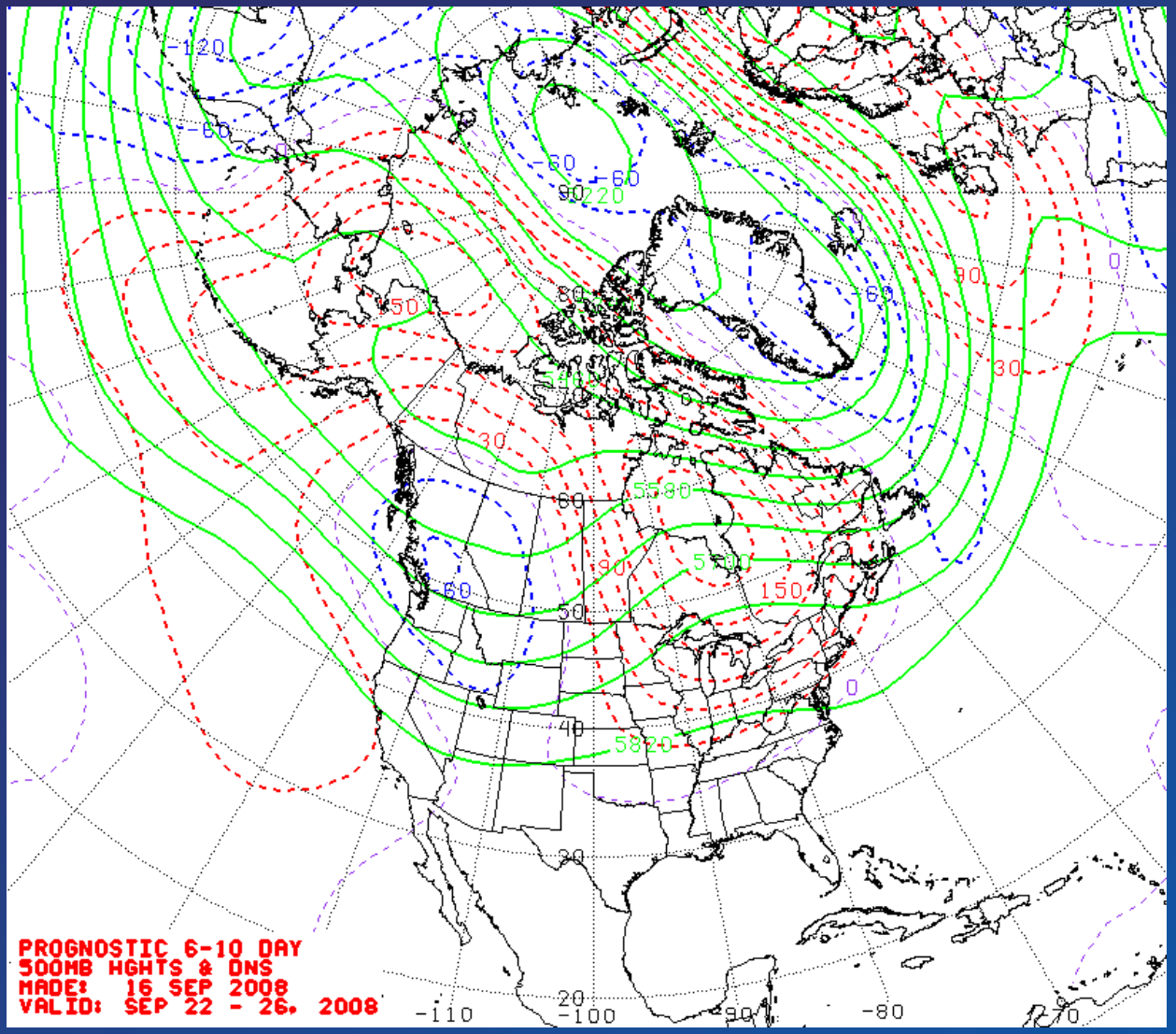
- D0 (Abnormally Dry) covering most of Montana
- Areas of D2 (Severe) and D3 (Extreme) reduced in eastern Montana as a result of recent storms





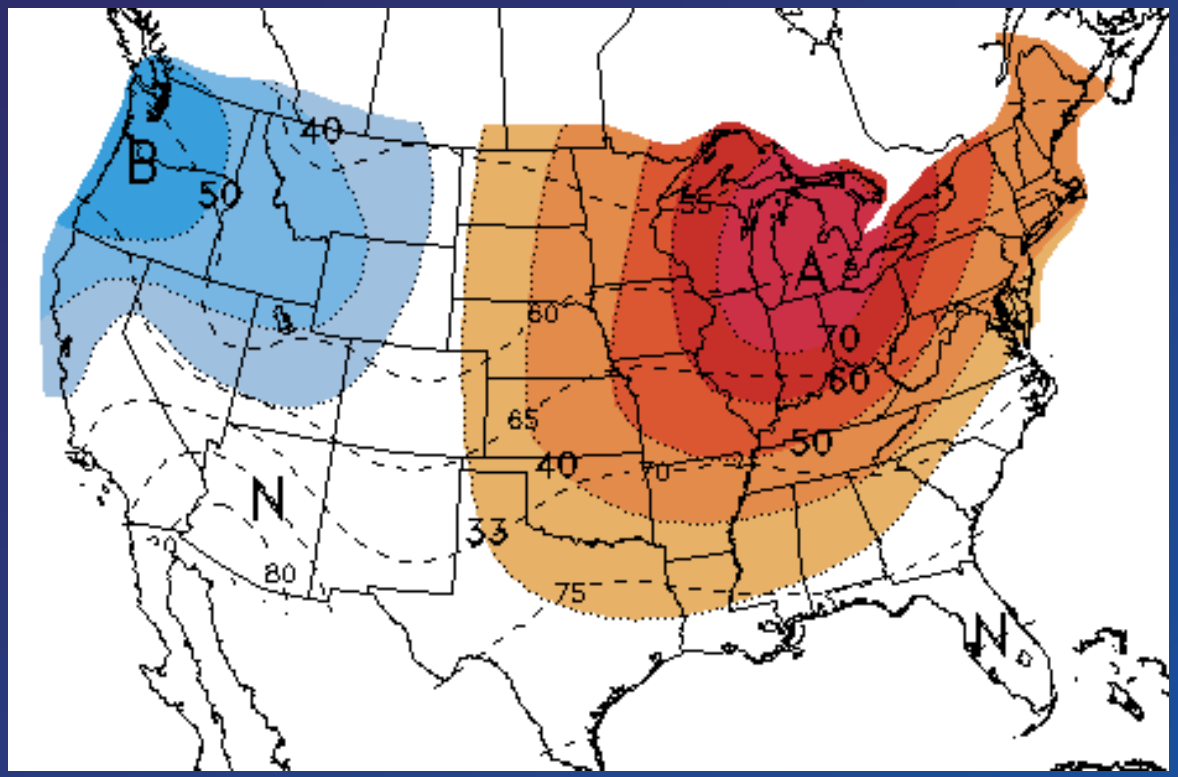
6 to 10 Day Outlook

500mb Heights and Anomalies



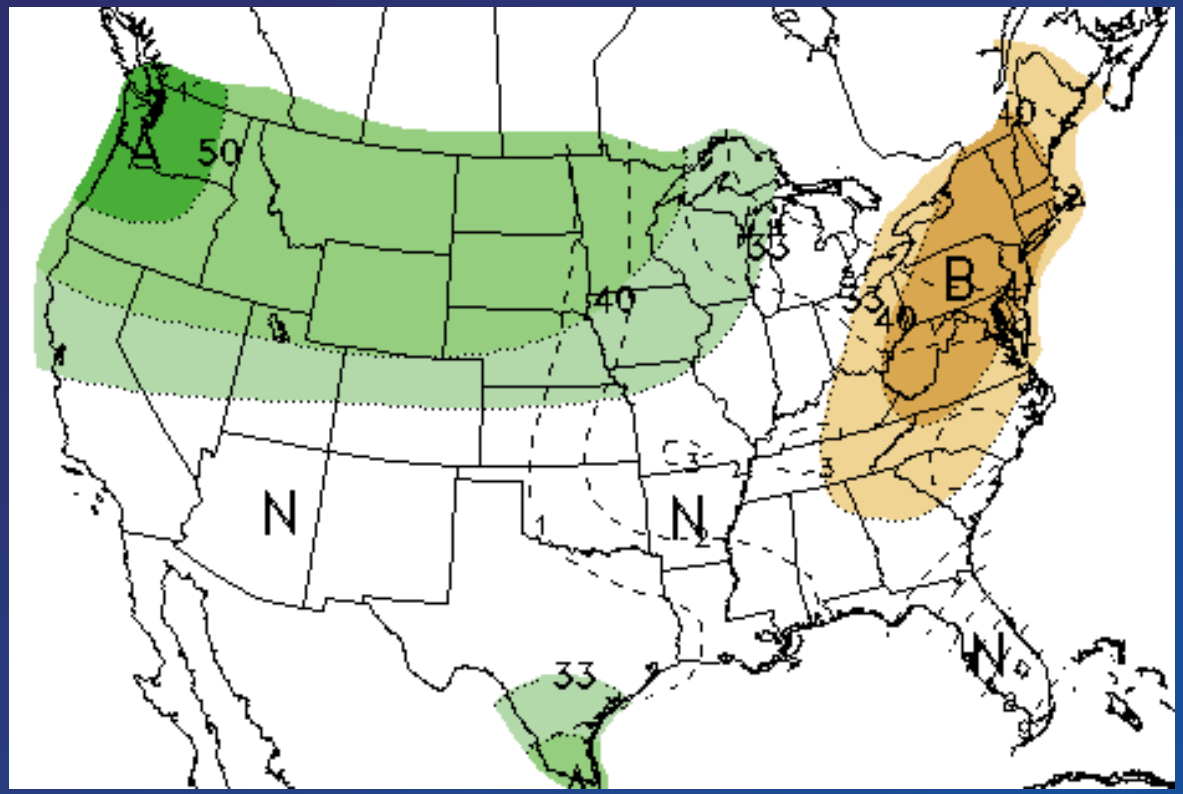
- September 22 - 26
- Another low pressure trough pushing through Montana

6 to 10 Day Outlook – Temperatures



- September 22 - 26
- Most of Montana has better chances for below normal temperatures
  - *40% to 50% chance for below normal temperatures west of the divide*
  - *33% to 40% chance for below normal temperatures east of the divide*
- Averages
  - *Highs in the mid 60s to lower 70s*
  - *Lows in the lower 30s to near 40*

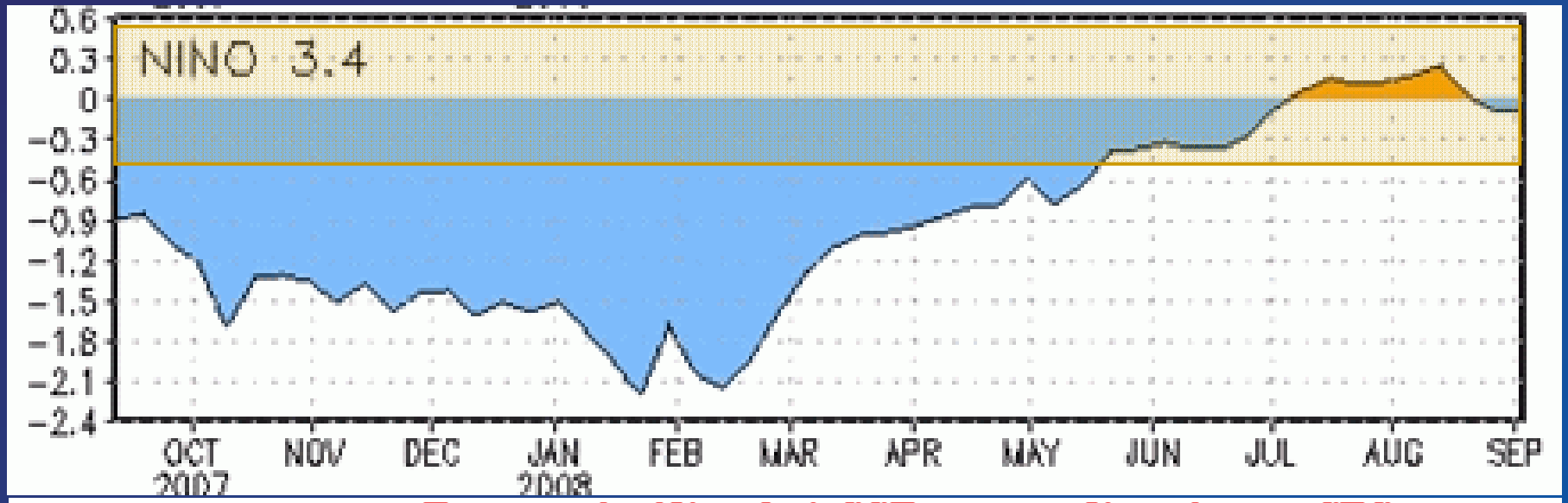
6 to 10 Day Outlook – Precipitation

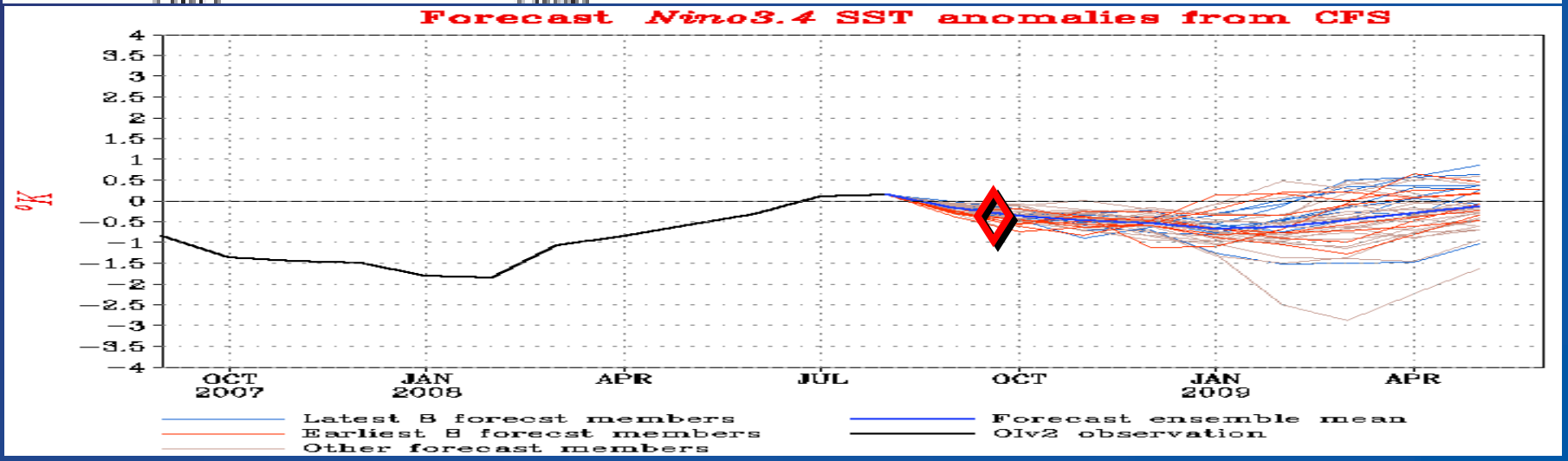


- September 22 - 26
- Better chances for above normal precipitation across Montana
  - *40% to 50% chance of above normal precipitation*
- Normals
  - *~1.00 – 1.50 inches*

El Niño / La Niña

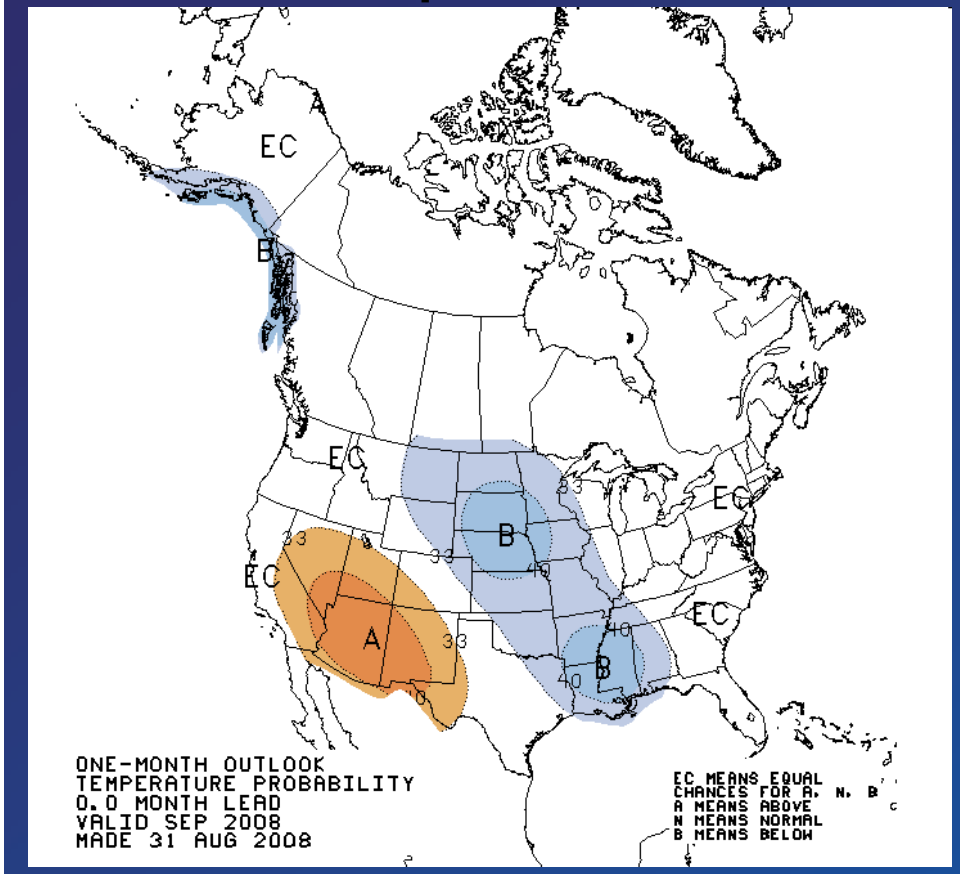
- ENSO-neutral conditions are expected to continue through the remainder of 2008





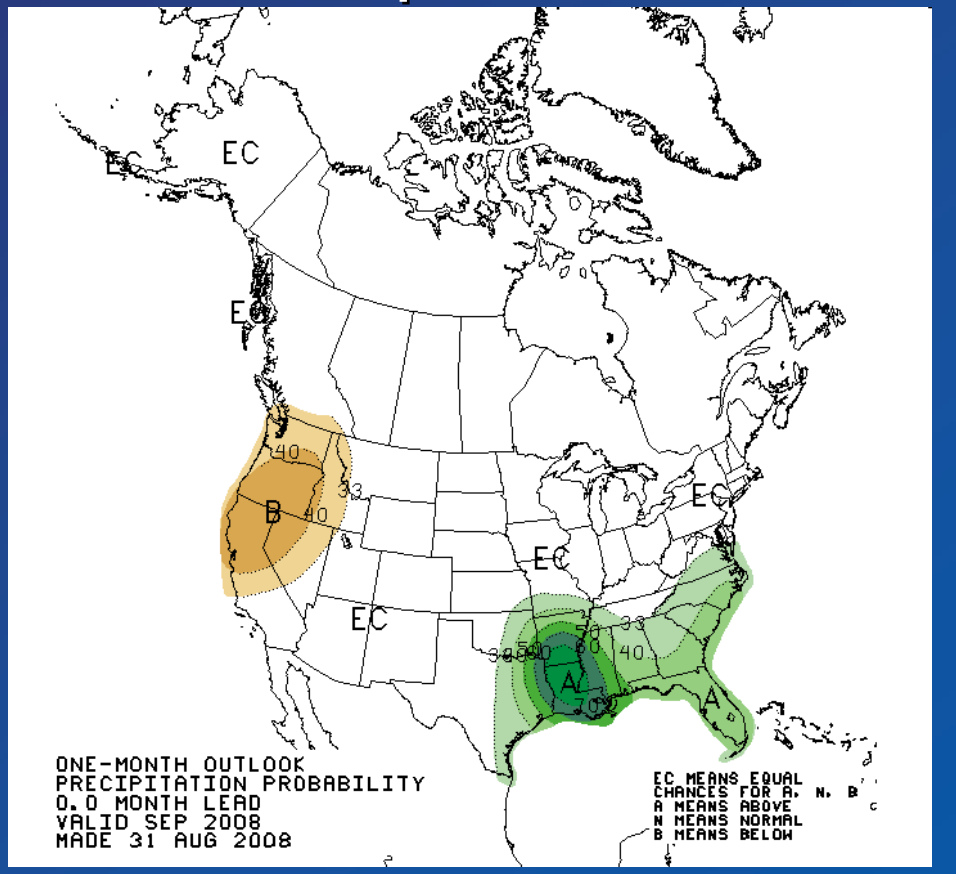
September Outlook

Temperature



- Equal chances temperatures will be above...below or near normal across western half of Montana
- 33% to 40% chance temperatures will be below normal across eastern half of Montana

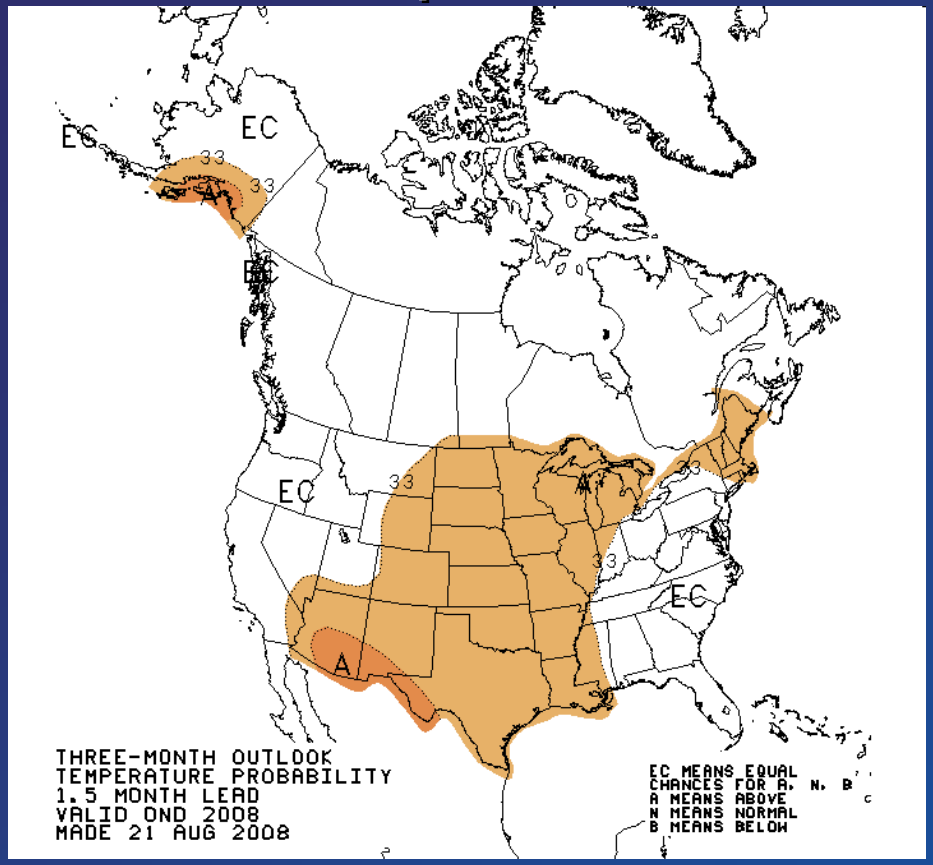
Precipitation



- 33% to 40% chance precipitation will be below normal along Montana/Idaho border
- Equal chances precipitation will be above...below or near normal across remainder of Montana

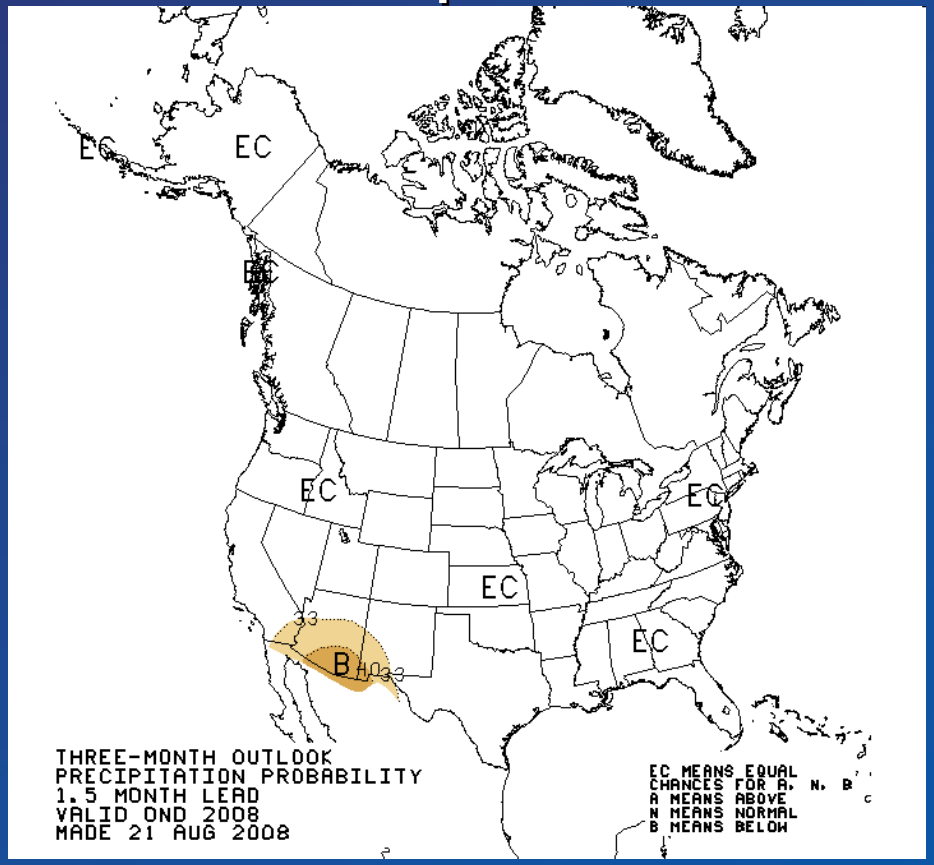
October - December Outlook

Temperature



- 33% to 40% chance precipitation will be below normal over east/southeast Montana
- Equal chances temperatures will be above... below or near normal over remainder of the state
- Update scheduled Sept 18

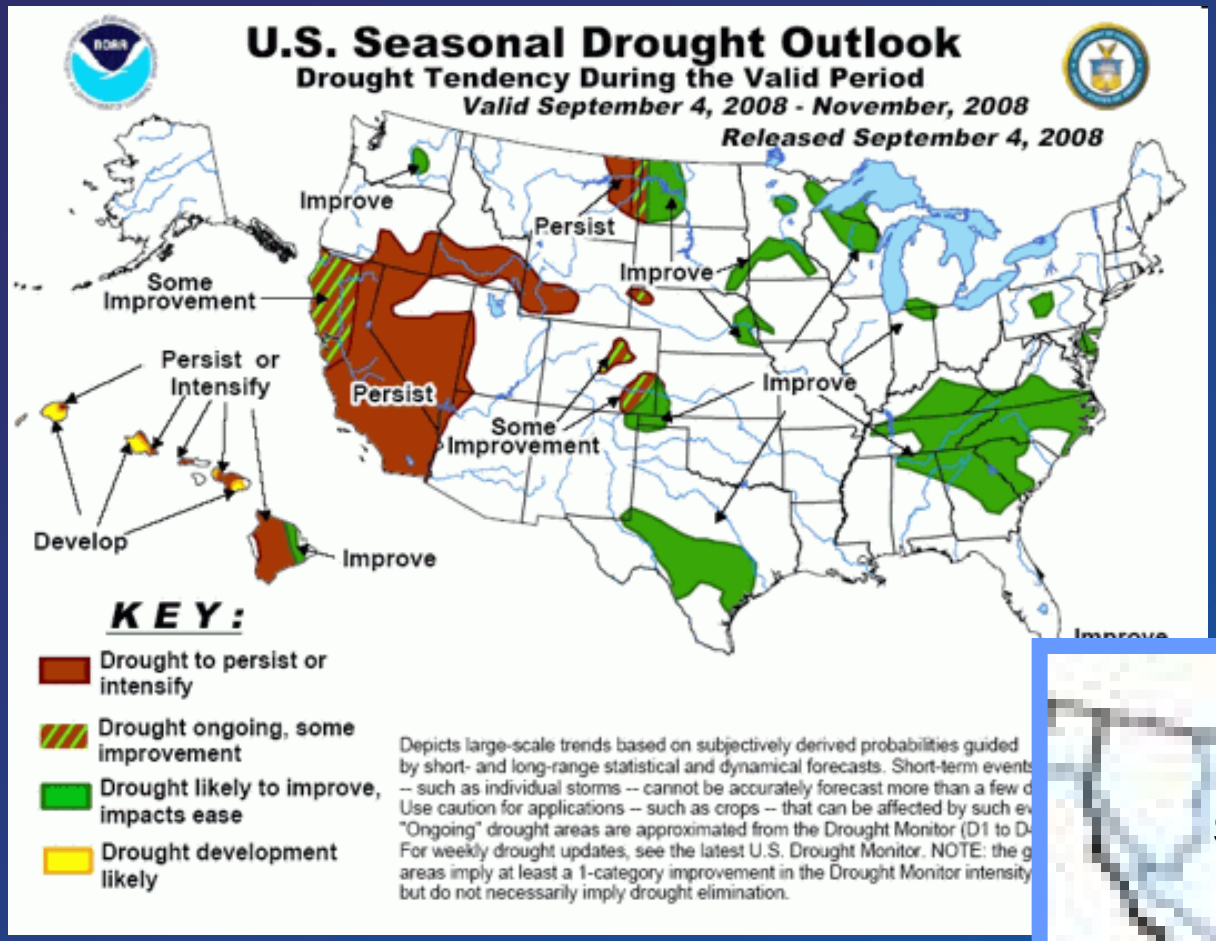
Precipitation



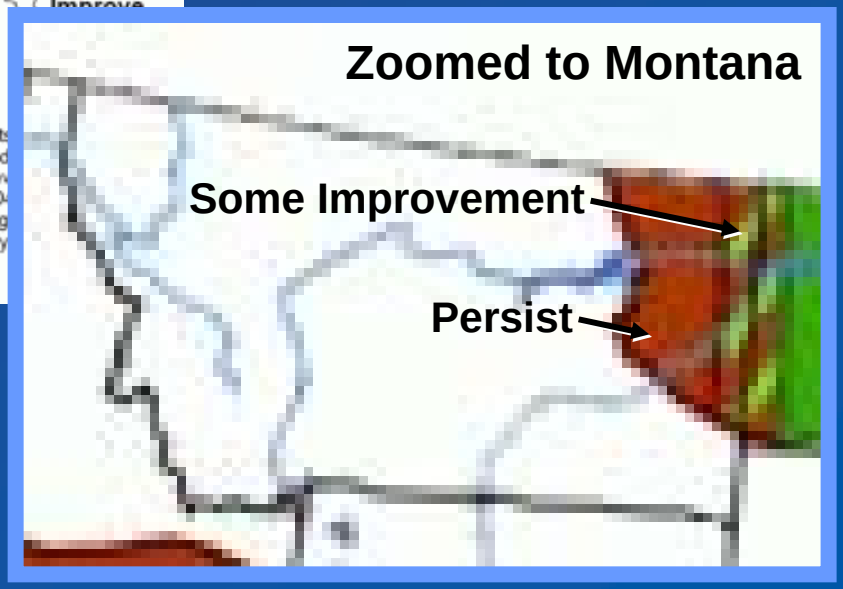
- No forecast skill... equal chances precipitation will be above... below or near normal

Drought Outlook

Issued September 4, 2008



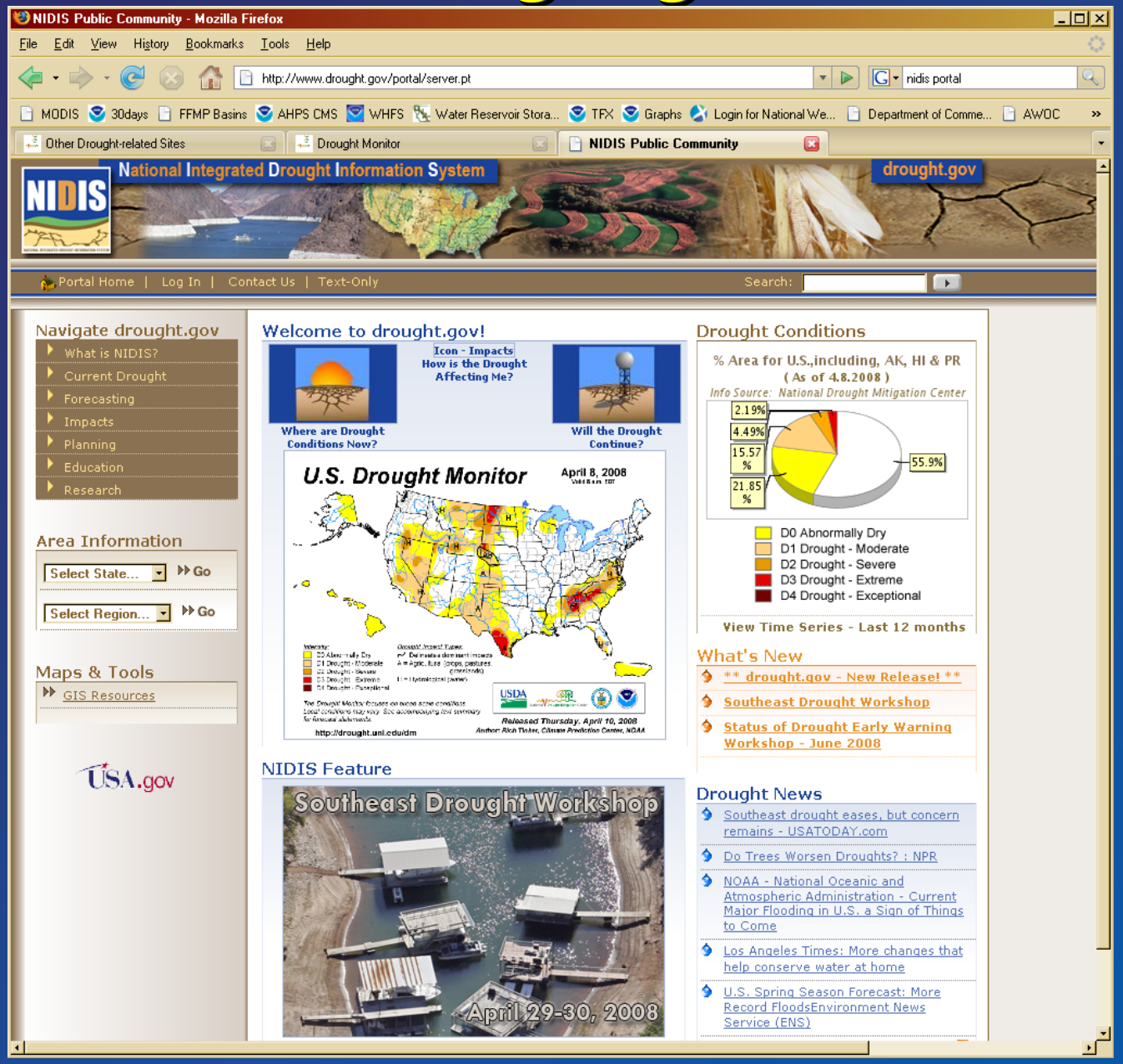
- Drought expected to persist northeast/east
- Drought improvement expected along North Dakota border



In Summary...

- August brought below normal precipitation to much of Montana
  - *Driest areas were along the Rocky Mountains*
  - *Storm brought in some precipitation during the last day of the month and Sep 1*
- September has seen a series of weather systems move through bringing much above normal precipitation to large areas of the state... mainly east of the divide
  - *Northwest and portions of southwest Montana continue to see below to well below normal precipitation*
  - *Snow fell on September 1 over mountains and in some lower elevation locations*
- Crop year below to well below normal west of the divide... near to below normal east of the divide
- Water year mostly near normal
  - *Exceptions with below normal conditions northwest, southwest, south central and east*
  - *Water Year 2008 ends at the end of September*
- Current Drought Outlook indicates persistence expected east
  - *This could change with next issuance considering recent precipitation*

drought.gov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How is the Drought Affecting Me?
Where are Drought Conditions Now?
Will the Drought Continue?
U.S. Drought Monitor
April 8, 2008
Released Thursday, April 10, 2008
http://drought.unl.edu/dm
NIDIS Feature
Southeast Drought Workshop
April 29-30, 2008
Drought Conditions
% Area for U.S.,including, AK, HI & PR
(As of 4.8.2008)
Info Source: National Drought Mitigation Center
2.19%
4.49%
15.57 %
21.85 %
55.9%
D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe
D3 Drought - Extreme
D4 Drought - Exceptional
View Time Series - Last 12 months
What's New
** drought.gov - New Release! **
Southeast Drought Workshop
Status of Drought Early Warning Workshop - June 2008
Drought News
Southeast drought eases, but concern remains - USATODAY.com
Do Trees Worsen Droughts? : NPR
NOAA - National Oceanic and Atmospheric Administration - Current Major Flooding in U.S. a Sign of Things to Come
Los Angeles Times: More changes that help conserve water at home
U.S. Spring Season Forecast: More Record FloodsEnvironment News Service (ENS)

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Missouri River near Cascade